

III. REMARKS

Status of the Claims

Claims 1 and 10 are amended. Claims 1-18 remain under consideration.

Summary of the Office Action

Claims 1,2,6-9, and 12-15 stand rejected under 35USC102(e) on the basis of the cited reference Kim (WO98/19434). Claims 4,5,10, and 11 stand rejected under 35USC103(a) based on the cited reference Kim in view of the reference Eriksson (WO98/16047). The Examiner is respectfully requested to reconsider his rejections in view of the following remarks. Claim 3 has been indicated to contain patentable subject matter if written in independent form.

The Invention

The invention of the applicant utilizes a touch screen-style structure fixed in the keypad structure in such a manner that the keypad structure is not only as thin as possible, but also so that the number of signals drawn over the interface between the key body element and the body of the device is as small as possible. Problems caused by the large number of key signals are described in detail in the introduction of the applicant's invention. Thus, the subject invention is related to a substantially different problem than that of Kim. The examiner has mistakenly concluded that the subject invention is based on having two different keypads in the same flap structure. This is not the case.

The keypad of this invention is described in this application with reference particularly to figure 3, as having a mat 16 having multiple keys. Mats of this type are made of membrane

materials that supports individual keys in a manner that allows a particular key to be depressed substantially independently. The mat 16 is supported over a touch sensitive element 19 that provides a signal when touched that is indicative of the position of the touch on the element 19. When a key on the mat 16 is depressed it causes a response from the touch sensitive element 19 at the position at which the key touches element 19. This structure has been emphasized in the amended claims 1 and 10.

Each of the "touch sensitive" keys of the reference Kim require the closing of individual contacts. Each of the contacts provides an individual signal relative to the character of the key being pressed. A lead is required for each of the keys. This is precisely the problem which is avoided by the subject invention.

As exemplified in the membrane structure of figure 4 of this application, only 4 leads are required where there are two membranes 19a and 19 b close to each other, and when pressing the upper one of the membranes at a certain spot, voltages Xout and Yout are generated to the output of the touch keypad structure, on the basis of which it is possible to determine the pressed spot on the touch membrane and through that also the pressed key. As an example of the implementation is mentioned the EMFi membrane. With the solution according to the invention, it is enough that only 4 signals (Xin, Yin, Xout, Yout) are drawn from the keypad over the interface to the control unit of the device.

Discussion of the Cited References

Kim relates to two different keypads implemented to a flap structure of a mobile phone. The first keypad 28 is on the outer surface of the flap and can thus be used when the flap is closed.

According to figure 1, the first keypad comprises the keys required for basic phone functions, such as the number keys and the */# keys. The second keypad 30 is on the inner surface of the flap and becomes visible when the flap is opened. Said second keypad comprises a larger number of keys and aims to offer the user more versatile possibilities for inputting characters by comprising a PDA-type keypad, where there are separate keys for different letters.

In the beginning of page 5, Kim describes the first keypad and especially its implementation. On the basis of the description, the first keypad 28 is a conventional keypad structure, where key contacts are arranged on the circuit board 32 and the inner surface of the keyboard mat on top of the circuit board is provided with the transmitting key elements, in which case pressing a certain key of the keymat causes a key contact on the surface of the circuit board closing said contacts associated with the transmitting key element and at the same time offers the user tactile feedback.

The structure of the second keypad 30 is described on the same page. Kim discloses that the second keypad is implemented by using a membrane key structure, where there are key contacts on the surface of the circuit board, and on top of them, a membrane structure. When pressing the membrane at the spot of a certain character, the transmitting surface below causes the key contact on the circuit board to activate. Later on page 5 it is also noted that said membrane key does not offer tactile feedback for the user, and that the surface of the keypad is substantially completely smooth. The operation of the keypads of Kim is clearly described in Kim, on page 5, lines 15-20, as follows:

"Under each of the characters, a thin conductor is shaped to span two contacts on an underlying printed circuit board. Depressing the membrane in the area of a particular character causes the underlying electrical conductor to complete a circuit across the associated contacts."

Both the first keypad 28 and the second keypad 30 have contact pairs implemented on the circuit board, short circuiting which contact pairs either with the transmitting element of the keymat or by using the membrane causes a key signal to be generated.

In the implementation described in figure 4 of Kim, it is confirmed that both keypads are indeed implemented with a structure where there is a contact pair on the circuit board for each key on both keypads, which by short-circuiting causes a key signal at a certain crossing of a column and a line. In order to transmit signals from the flap structure to the control unit of the phone, which is located in the body of the phone, the large number of signals is required by the key matrix as well as the operating voltage signals. As Kim later states on page 7, lines 10 to 15, altogether 21 leads must be drawn from the flap to the body by using a flat cable 44.

The keyboard of Kim is, therefore, substantially different than the invention described in the claims of this application. In fact, this invention is designed to avoid the massive number of leads required by systems such as described in Kim. There is nothing in the disclosure of Kim that describes the use of a touch sensitive element to generate signals indicative of particular key of a keyboard. The reference Kim, therefore, fails to support the rejections based on either anticipation or obviousness.

The Issue of Anticipation

It is well settled that a claim is anticipated, "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (See CHISOLM, Federal Circuit Guide, Pg. 1221).

"...it must be shown that the reference contains all of the elements of the claims apart from irrelevant or merely extraneous variations, and the elements are arranged in the same way to achieve the same result which is asserted to be an inventive function..." 454 U.S. 1129 (1981)

The elements of the claim and their function and purpose within the claim must be reviewed in a manner similar to an infringement analysis. If the device described in the cited reference would not infringe if it was later, it will not anticipate if the reference is earlier.

Applying this standard to the device of the reference Kim it becomes clear that the system of Kim is missing significant elements of independent claims 1 and 10. There is no provision in the system of Kim for using a touch sensitive element for generating key indicating signals as in the keyboard of this invention. Claim 1 states:

"A keyboard plate (16) is arranged as fixed over the touch sensitive element (19) so that the depression of a key is arranged to cause said key to touch the touch sensitive element essentially at the point of the key (15a, 15b), and that the electronic device (1) comprises means (21, 22b) for determining the point of touching in the touch sensitive element (19), whereby it is arranged to be determined on the basis of the determined point of touching which key (15a, 15b) has been depressed."

Equivalent language also is contained in claim 10. Since these elements form no part of the system of Kim, there would be no infringement, if Kim was later, therefore, the cited reference

Kim does not support the rejection by the Examiner based on anticipation.

The above arguments are equally applicable to the rejected dependent claims.

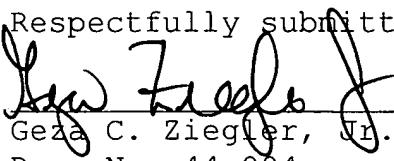
The Issue of Obviousness

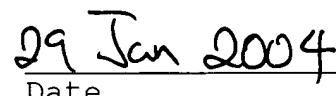
The combination of the disclosure of Kim with the disclosure of Eriksson does not remedy the significant deficiencies of the reference Kim as described above. Applicant submits that the rejection under 35USC103 must also fail for the reasons stated above.

In view of the remarks stated above, Applicant submits that all of the claims under consideration contain patentable subject matter and favorable action by the Examiner is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

Enclosed is a check in the amount of \$110.00 for a one month extension. The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,


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